



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/591,437	06/09/2000	Jiuzhi Xue	DIS-P016	3249
25231	7590	09/12/2006	EXAMINER	
MARSH, FISCHMANN & BREYFOGLE LLP 3151 SOUTH VAUGHN WAY SUITE 411 AURORA, CO 80014			DUONG, THOI V	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 09/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.



UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 09/591,437
Filing Date: June 09, 2000
Appellant(s): XUE ET AL.

MAILED

SEP 12 2006

GROUP 2800

Robert G. Crouch (Reg. No. 34,806)
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed June 19, 2006 appealing from the
Office action mailed August 24, 2005.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows:

NEW GROUND(S) OF REJECTION

Claims 1, 3-10, 14 16-24 and 26 are rejected under 35 U.S.C. 102(e) as anticipated by Liu et al. (USPN 6,141,076).

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,141,076	Liu et al.	10-2000
5,323,253	Iwayama et al.	6-1994

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 25 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The claim contains the limitation "wherein the ferroelectric liquid crystal material in the optical device is surface stabilized" which is failed to comply with the enablement requirement. The specification discloses a SSFLC (surface-stabilized ferroelectric liquid crystal (FLC) comprising a structure free of chevron structures without a need to otherwise apply an additional treatment to the optical device. The claimed invention is not enable since the SSFLC comprising a structure free of chevron structures without a need to otherwise apply an additional treatment to the optical device contradicts Liu's disclosure, USPN 6,141,076, where Liu discloses an optical device having a similar structure free of chevron with the claimed invention and alignment treatment is the only treatment. However, Liu's disclosure directs to a non-surface-stabilized ferroelectric liquid crystal instead of the surface-stabilized FLC of the claimed invention.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1, 3-10, 14, 16-24 and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by Liu et al. (USPN 6,141,076).

Re claims 1 and 14, as shown in Figs. 1 and 4, Liu discloses an optical device (as well as a method for preventing formation of chevron structures in the optical device) including a ferroelectric liquid crystal material 16, said optical device comprising:

- a first substrate 10 and a second substrate 11;
- a first alignment treatment applied to a surface of the first substrate, said first alignment treatment being intended to induce an orientation of at least a portion of said ferroelectric liquid crystal material along a first alignment direction 25 and with a first

Art Unit: 2871

pretilt angle "alpha1" with respect to a plane parallel to said first substrate (Fig. 4 and col. 3, line 35 through col. 4, line 60);

a second alignment treatment applied to a surface of the second substrate, said second alignment treatment being intended to induce an orientation of at least another portion of said ferroelectric liquid crystal material along a second alignment direction 26 and with a second pretilt angle "alpha2" with respect to a plane parallel to said second substrate (Fig. 4 and col. 3, line 35 through col. 4, line 60),

wherein the first substrate is located with respect to the second substrate in such a way that the surfaces of the first and second substrates onto which the first and second alignment treatments were applied, respectively, are spaced apart, generally parallel and facing each other and a projection of the first alignment direction onto the treated surface of the first substrate makes a non-zero angle "omega" (or Liu's buffing angle) with respect to a projection of the second alignment direction onto the treated surface of the first substrate such that, said ferroelectric liquid crystal material being injected between the first and second substrates (Figs. 3A, 3B and 4; col. 4, lines 4-60).

Liu discloses a problem in Prior Art where a typical SSFLC (surface-stabilized ferroelectric liquid crystal) creates a "chevron" structure which resulted in a high transmission loss due to strong buffing when parallel rubbing is applied to the substrates (col. 1, lines 25-34 and col. 4, lines 36-46). Liu overcomes the problem by providing a ferroelectric liquid crystal structure wherein excellent contrast is obtained with weak buffing or even greater contrast provided with strong buffing (col. 4, lines 47-53). Accordingly, it is obvious that Liu creates a structure without the need to otherwise

Art Unit: 2871

apply an additional treatment to the optical device since buffing (weak or strong) is the only treatment in the optical device of Liu et al. to overcome a chevron or a quasi-bookshelf generated in parallel alignment case in some traditional configurations. In addition, Liu et al. also discloses that the buffing angles of the substrates are at an angle, with respect to one another, of less than 90 degrees, preferably at about 45 degrees (col. 4, lines 53-60). Accordingly, Liu also creates a cross-buffed optical device. Since the structure recited in the Liu's reference is substantially identical to that of claims 1 and 14, claimed properties or functions are presumed to be inherent (see MPEP 2112.01). Thus, the structure of Liu is inherently free of chevron.

Re claims 3 and 16, said ferroelectric liquid crystal material has a cone angle "theta", said non-zero angle "omega" has a predetermined value such that "omega" $\geq 2(\text{theta})$ and "omega" is different from 180 degrees (col. 4, lines 53-60).

Re claims 4, 17 and 21, said first and second alignment treatments are specifically chosen so as to specifically induce pretilt angles of "alpha1" and "alpha2" (Liu's angle theta 0) respectively (Fig. 4 and col. 4, lines 23-26), wherein said choosing step further includes the step of taking into consideration molecular anchoring properties of said first and second alignment treatments so as to choose first and second alignment treatments to specifically induce pretilt angles of "alpha 1" and "alpha 2", respectively, while providing strong molecular anchoring of at least portions of the ferroelectric liquid crystal material located immediately adjacent to the treated surfaces of the first and second substrates (col. 3, lines 36-45 and col. 4, lines 46-66).

Art Unit: 2871

Re claims 5 and 18, said first alignment treatment includes a coating of a selected alignment material, said coating being applied, cured and treated so as to specifically induce the pretilt angle of "alpha1" (col. 3, lines 31-45).

Re claims 6 and 19, said second alignment treatment includes a coating of another selected alignment material, said coating being applied, cured and treated so as to specifically induce the pretilt angle of "alpha2" (col. 3, lines 31-45 and col. 4, lines 23-26).

Re claims 8 and 20, said first and second alignment treatments are generally identical (col. 3, lines 31-45).

Re claim 7, each of said pretilt angles is between about 3 degrees and about 7 degrees (col. 8, lines 36-44); and

Re claim 9, said first and second alignment treatments provide strong molecular anchoring of at least portions of the ferroelectric liquid crystal material located immediately adjacent to the treated surfaces of the first and second substrates (col. 4, lines 46-52).

Re claims 10 and 22, as shown in Figs. 10A and 10B, an optical device of Liu further comprises a light input 1018 directed at said optical device in such a way that the optical device in turn produces a light output of a particular optical state; and means 1022 for electrically addressing said optical device in such a way that the particular optical state of the light output is continuously variable between a minimum optical state (V-) and a maximum optical state (V+).

Art Unit: 2871

Re claims 23 and 24, Liu discloses that the first and second pretilt angles are non-zero (col. 4, lines 23-26 and col. 8, lines 42-44).

Re claim 26, Liu discloses an optical device comprising all limitations of claim 1, wherein the first and second substrates are spaced apart by a distance sufficiently small to suppress formation of helixes typically formed of the ferroelectric liquid crystal material (col. 3, lines 50-57).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 12 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al. (USPN 6,141,076) in view of Iwayama et al. (USPN 5,323,253).

Liu et al. discloses an optical device that is basically the same as that recited in claims 2, 12 and 15 except for a reflective display surface and a phase sequence of the ferroelectric liquid crystal material.

As shown in Fig. 3, Iwayama et al. discloses a ferroelectric liquid crystal device comprising a reflective display surface formed on a substrate (col. 5, lines 16-20), wherein the liquid crystal shows a phase sequence of Isotropic – Nematic - Smectic A - Smectic C* - Crystalline states (col. 5, lines 52-59).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the optical device of Liu et al. with the teaching of Iwayawa et al. by forming a reflective surface for a reflective display and employing a ferroelectric liquid crystal material having a phase sequence of Isotropic – Nematic - Smectic A - Smectic C* - Crystalline states for avoiding the change in cell thickness and the occurrence of liquid crystal void (col. 5, lines 64-68).

Allowable Subject Matter

Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims (see Reasons for Allowance below).

Claim 13 is allowed.

The following is an examiner's statement of reasons for allowance: none of the prior art of record fairly suggests or shows all of the limitations as claimed. Specifically,

None of the prior art of record discloses, in combination with other limitations as claimed, an optical device including a ferroelectric liquid crystal material having free of chevron structures without a need to otherwise apply an additional treatment to the optical device, wherein an optical retardance of the optical device remains generally constant during continuous variation of the optical state of the light output.

The most relevant reference, USPN 6,141,076 of Liu et al., fails to disclose or suggest a constant optical retardance of the optical device remained during continuous variation of the optical state of the light output. As shown in Figs. 10A and 10B, the Liu et al.'s reference only discloses that the particular optical state of the light output is

Art Unit: 2871

continuously variable between a minimum optical state (V-) and a maximum optical state (V+) (col. 5, lines 40 through col. 6, line 12).

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

(10) Response to Argument

Applicant's arguments filed June 19, 2006 have been fully considered but they are not persuasive.

Claim Group A (claims 1, 3-10, 14 and 16-24):

Applicant argued that Liu does not disclose or suggest a crossed-buffed device and a ferroelectric liquid crystal material being free of chevron structures without the need to otherwise apply an additional treatment to the optical device and that the Examiner misrepresents what is disclosed by Liu. The Examiner disagrees with the Applicant's remarks since Liu discloses a problem in Prior Art where a typical SSFLC (surface-stabilized ferroelectric liquid crystal) creates a "chevron" structure which resulted in a high transmission loss due to strong buffing when parallel rubbing is applied to the substrates (col. 1, lines 25-34 and col. 4, lines 36-46). Liu then overcomes the problem by providing a ferroelectric liquid crystal structure wherein excellent contrast is obtained with weak buffing or even greater contrast provided with strong buffing (col. 4, lines 47-53). Accordingly, it is clear that Liu creates a structure without the need to otherwise apply an additional treatment to the optical device since

Art Unit: 2871

buffing (weak or strong) is the only treatment in the optical device of Liu to overcome a chevron or a quasi-bookshelf generated in parallel alignment case in some traditional configurations. In addition, Liu also discloses a cross-buffed optical device as shown in Figs. 3A and 3B where the buffing directions 312a on a first substrate and 312b on a second substrate are crossed (twisted) relative to each other (col. 3, lines 64-67). Liu suggests the buffing angles of the substrates of less than 90 degrees, preferably at about 45 degrees (col. 4, lines 53-60). Finally, since the structure recited in the Liu's reference is substantially identical to that of claims 1 and 14, claimed properties or functions are presumed to be inherent (see MPEP 2112.01). Thus, the structure of Liu is inherently free of chevron and a prima facie case of either anticipation or obviousness has been established.

Claim Group B (claim 25):

Applicant argued that "surface stabilized" is widely used in the ferroelectric liquid crystal art since the Examiner feels a skilled practitioner would have difficulty with the limitation "wherein the ferroelectric liquid crystal material in the optical device is surface stabilized." The Examiner realizes that the surface stabilized ferroelectric liquid crystal (SSFLC) is widely used in the art as disclosed by Liu in USPN 6,141,076 (col. 1, lines 12-21). However, in consideration with other limitations in claim 25, the SSFLC comprising a structure free of chevron without a need to otherwise apply an additional treatment to the optical device of the claimed invention seems to contradict Liu's disclosure. According to USPN 6,141,076, Liu discloses a similar structure free of chevron with the claimed invention as discussed above and alignment treatment is only

Art Unit: 2871

treatment; however, Liu's disclosure directs to a non-surface-stabilized ferroelectric liquid crystal instead of a surface-stabilized FLC of the claimed invention. Because Liu's disclosure has been patented, Liu's disclosure is presumed valid over the claimed invention.

Claim Group C (claim 26):

In addition to all limitations of claim 1 which include the alignment treatments with cross buffing and the optical device free of chevron structures without a need to otherwise apply an additional treatment to the optical device as discussed above, claim 26 also recites the limitation "the first and second substrates are spaced apart by a distance sufficiently small to suppress formation of helixes typically formed in bulk of the ferroelectric liquid crystal material." Applicant argued that this limitation is not found in Liu in an embodiment that shows cross buffing. The Examiner again disagrees with Applicant's remarks since this limitation is conventional and well known in the art as disclosed by Liu for suppression of the formation of helixes (col. 3, lines 53-60). For this reason, the Examiner maintains the rejection of claim 26.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

This examiner's answer contains a new ground of rejection set forth in section (9) above. Accordingly, appellant must within **TWO MONTHS** from the date of this answer

Art Unit: 2871

exercise one of the following two options to avoid *sua sponte* dismissal of the appeal as to the claims subject to the new ground of rejection:

(1) **Reopen prosecution.** Request that prosecution be reopened before the primary examiner by filing a reply under 37 CFR 1.111 with or without amendment, affidavit or other evidence. Any amendment, affidavit or other evidence must be relevant to the new grounds of rejection. A request that complies with 37 CFR 41.39(b)(1) will be entered and considered. Any request that prosecution be reopened will be treated as a request to withdraw the appeal.


(2) **Maintain appeal.** Request that the appeal be maintained by filing a reply brief as set forth in 37 CFR 41.41. Such a reply brief must address each new ground of rejection as set forth in 37 CFR 41.37(c)(1)(vii) and should be in compliance with the other requirements of 37 CFR 41.37(c). If a reply brief filed pursuant to 37 CFR 41.39(b)(2) is accompanied by any amendment, affidavit or other evidence, it shall be treated as a request that prosecution be reopened before the primary examiner under 37 CFR 41.39(b)(1).

Extensions of time under 37 CFR 1.136(a) are not applicable to the TWO MONTH time period set forth above. See 37 CFR 1.136(b) for extensions of time to reply for patent applications and 37 CFR 1.550(c) for extensions of time to reply for ex parte reexamination proceedings.

Respectfully submitted,

Thoi V. Duong




ANDREW SCHECHTER
PRIMARY EXAMINER

**A Technology Center Director or designee must personally approve the
new ground(s) of rejection set forth in section (9) above by signing below:**

Janice Falcone, Director

Handwritten signature of Janice Falcone
for 2000

Conferees:

Rodney Bovernick, SPE AU 2874

RB

Date: *9/5/06*

Ricky Mack, SPE AU 2873

R. Mack

Date: *9/1/06*

Thoi Duong, Examiner AU 2871

Thoi Duong

Date: *9/01/06*